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**Datasheet for the decision
of 4 July 2023**

Case Number: T 1172/21 - 3.3.05

Application Number: 13892796.7

Publication Number: 3042971

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C22C1/04, C22F1/08, B22F3/16,
B22F3/24, B22F9/08

Language of the proceedings: EN

Title of invention:

LEAD-FREE HIGH-SULPHUR EASY-CUTTING ALLOY CONTAINING MANGANESE
AND COPPER AND PREPARATION METHOD THEREFOR

Patent Proprietor:

Hunan Terry New Materials Company Ltd.

Opponent:

OTTO FUCHS - Kommanditgesellschaft

Headword:

Lead free copper alloy/Hunan Terry

Relevant legal provisions:

EPC Art. 56

RPBA 2020 Art. 13(2)

Keyword:

Inventive step - main request (no) - auxiliary request (yes)
Amendment after summons - taken into account (yes)

Decisions cited:

T 0939/92, T 0653/93, T 0065/96, T 0175/97, T 0594/01,
T 0210/05, T 2295/19, T 1688/20

Catchword:



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Case Number: T 1172/21 - 3.3.05

D E C I S I O N
of Technical Board of Appeal 3.3.05
of 4 July 2023

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Decision under appeal: **Interlocutory decision of the Opposition
Division of the European Patent Office posted on
31 May 2021 concerning maintenance of the
European Patent No. 3042971 in amended form.**

Composition of the Board:

Chairman E. Bendl
Members: G. Glod
S. Fernández de Córdoba

Summary of Facts and Submissions

I. The appellant's (opponent's) appeal lies from the opposition division's decision finding that the European patent EP 3 042 971 B1 in amended form, based on the then auxiliary request 1, met the requirements of the EPC.

II. The following documents cited in the impugned decision are of relevance here:

D1: US 2012/0121455 A1
D2: US 2012/0237393 A1
D3: CN 102634688 A
D3': machine translation of D3

Claim 5 of the main request (auxiliary request 1 underlying the impugned decision) reads as follows:

"5. A lead-free, high-sulphur and easy-cutting copper-manganese alloy, characterized in that: the alloy comprises the following components in percentage by weight are Cu 74-90 wt.%, P 0.001-0.12 wt.%, Sn 5-20 wt.%, Mn 2.5-3.5 wt.%, S 0.2-1.0 wt.%; one or more metals other than Zn that have an affinity to sulphur less than the affinity of manganese to sulphur, with the sum of the contents thereof not more than 2.0 wt.%, and the balance being Zn and inevitable impurities, where Pb is not more than 0.05 wt.%; wherein said metals other than Zn that have an affinity to sulphur less than the affinity of manganese to sulphur are Ni, Fe, W, Co, Mo, Sb, Bi and Nb."

Claim 1, under debate, of auxiliary request A reads as follows:

"1. A lead-free, high-sulphur and easy-cutting copper-manganese alloy, characterized in that: the alloy comprises the following components in percentage by weight are Cu 54.0-68.0 wt.%, P 0.001-0.15 wt.%, Sn 0.01-1 wt.%, Mn 1.5-4.0 wt.%, S 0.2-0.6 wt.%, one or more metals other than Zn that have an affinity to sulphur less than the affinity of manganese to sulphur, with the sum of the contents thereof not more than 1.8 wt.%, and the balance being Zn and inevitable impurities, where Pb is not more than 0.05 wt.%; wherein said metals other than Zn that have an affinity to sulphur less than the affinity of manganese to sulphur are Ni, Fe, W, Co, Mo, Sb, Bi and Nb."

Claims 2 to 4 include the features of claim 1, while claims 5 to 10 relate to method claims, which were not objected to by the appellant.

- III. The appellant argued that the subject-matter of claim 5 of the main request did not involve an inventive step in view of D1 and that claim 1 of auxiliary request A did not involve an inventive step in view of D2 alone or in combination with D3. The examples in the patent were not representative of the broad claim 1.
- IV. The respondent submitted that claim 5 of the main request involved an inventive step over D1 in combination with D3 and also that the subject-matter of the claims of auxiliary request A was considered to be inventive.
- V. At the end of the oral proceedings held on 4 July 2023, the parties' requests were as follows.

The appellant (opponent) requested that the decision under appeal be set aside and that the patent be revoked.

The respondent (patent proprietor) requested that the appeal be dismissed, or, alternatively, that the patent be maintained on the basis of either auxiliary request A or B, submitted on 20 February 2023.

Reasons for the Decision

Main request

1. Article 56 EPC
 - 1.1 Claim 5
 - 1.1.1 The invention concerns a lead-free, high-sulphur and easy-cutting copper manganese alloy.
 - 1.1.2 D1 is the closest prior art. It is not under debate that the skilled person would understand that claims 14 and 17 of D1 are supposed to refer back to claim 11. Claim 11 of D1 and the claims that are dependent thereon do not disclose an Mn content of 2.5 to 3.5 wt.% and a Pb content of not more than 0.05 wt.%.
 - 1.1.3 The problem to be solved by the patent is to provide a lead-free, easy-cutting copper alloy with excellent processing and application properties (see paragraph [0005]).
 - 1.1.4 It is proposed that the problem be solved by an alloy according to claim 5, characterised in that it

comprises 2.5-3.5 wt.% Mn, and not more than 0.05 wt.% Pb.

- 1.1.5 There is no example in the patent falling within the scope of claim 5 that demonstrates that specific properties were obtained. There is not even any evidence allowing it to be concluded that the same properties as in D1 are obtained. Therefore, the problem needs to be defined in a very unambitious way and can only be considered that of providing a further lead-free copper alloy.
- 1.1.6 The solution to this problem is obvious, since the concentrations of the elements in the alloy are considered to be arbitrary. It is known that lead-free copper alloys may comprise such amounts of Mn and not more than 0.05 wt.% Pb (see for example D3', abstract), which means that many arbitrary combinations are possible for lead-free copper alloys. A mere arbitrary choice from the possible solutions cannot involve an inventive step (T 939/92, point 2.5.3 of the Reasons).
- 1.1.7 To conclude, the subject-matter of claim 5 does not involve an inventive step and the main request is not allowable.

Auxiliary request A

2. Article 13(2) RPBA 2020

This request was submitted after the summons to oral proceedings had been notified. Article 13(2) RPBA 2020 applies.

The respondent indicated in their letter of 20 March 2023 that the request should be taken into

consideration in accordance with the Case Law of the Boards of Appeal. The appellant did not object to this.

The board follows the approach taken in T 2295/19 (point 3.4.14 of the Reasons) and takes auxiliary request A into account. In the current request, claims 5 to 8 of the main request, which were not considered allowable in the communication according to Article 15(1) RPBA 2020, have been deleted. The factual and legal scope of the appeal proceedings of the case at hand does not change as a result. No new discussion is required, either, and therefore this request does not go against procedural economy or against the principle of fair proceedings.

3. Article 56 EPC

3.1 Claim 1

3.1.1 The invention concerns a lead-free, high-sulphur and easy-cutting copper manganese alloy.

D2 is the closest prior art chosen by the appellant. The board agrees with this selection. This document discloses, in claim 10 in combination with claim 12, an alloy composition comprising about 58% to about 62% of copper, 0.01% to about 0.65% of sulfur, about 1.5% tin, less than 0.09% lead, 31.0% to about 41.0% zinc, about 1.5% nickel and about 0.01% to about 0.7% manganese. There is no disclosure of a P content of 0.001 to 0.15 wt.%, an Sn content of 0.01 to 1 wt.%, an Mn content of 1.5 to 4.0 wt.% and a Pb content of not more than 0.05 wt.%.

Although phosphorus may be added to the composition (paragraph [0063]), there is no direct and unambiguous

disclosure of the amount in that passage. The composition C85910 (Figure 2) contains 0.01% P, but this specific composition contains, for example, 0.09% lead and 0.01 to 0.7% Mn. Examples represent a specific combination of values that cannot be combined with the description (T 210/05, point 2.3 of the Reasons).

It is not accepted that a value of about 1.5 wt.% disclosed for Sn anticipates the range of 0.01 to 1 wt.%. The skilled person would not generally equate 1 wt.% with 1.5 wt.% in the context of a range of values. The error margin, if applicable at all, relates to experimental measurements. In T 175/97 (points 2.5 to 2.7 of the Reasons), cited by the appellant, the error margin related to Example 1 of E1. T 594/01 (point 4.1.5 of the Reasons) confirmed the uncertainty of a measured experimental value.

There is no disclosure in D2 that the amount of less than 0.09% given for Pb is supposed to imply an amount of not more than 0.05 wt.%. Less than 0.09% is not equal to not more than 0.05%, since the upper end point of 0.05% is not disclosed in D2. This finding is in line with T 1688/20 (see points 3.5.2 and 3.5.3 of the Reasons).

It is established case law that the question of disclosure cannot be assessed by contemplating the ranges of the various elements individually, since the subject-matter of claim 1 is constituted by the combination of the ranges of the composition (see Case Law Book 10th ed. I.C.6.3.3, particularly T653/93, point 3 of the Reasons and T65/96, point 5.3.1 of the Reasons).

- 3.1.2 The problem to be solved by the patent is to provide a lead-free, easy-cutting copper alloy with excellent processing and application (see paragraph [0005]).
- 3.1.3 It is proposed that the problem be solved by an alloy according to claim 1, characterised in that it comprises 0.001-0.15 wt.% P, 0.01-1 wt.% Sn, 1.5-4.0 wt.% Mn, and not more than 0.05 wt.% Pb.
- 3.1.4 There are several examples, such as Examples 2, 3 and 6 in the patent (Table 4), which prove that the problem is successfully solved. There is no evidence which would demonstrate that similar results were obtained with the alloy compositions in D2. It is true that the products according to the examples were obtained in accordance with a specific process. It is generally the case that, when a product is claimed, one specific process is disclosed for its production. This does not exclude other processes from existing. If a party argues that the properties of the product are linked to the specific process conditions, that party bears the burden of proof for their allegations (see Case Law Book 10th ed. III.G.5.1.1); however, in the current case, there is no evidence that the results presented in Table 4 would not be obtained with a different type of process (e.g. melting) or under different process conditions or with different starting materials. Therefore, the board has no reason to doubt that the problem has been solved successfully.
- 3.1.5 D2 does not provide any teaching leading towards the claimed ranges and does not provide any indication that the claimed ranges of P, Sn and Mn would allow the posed problem to be solved in an alloy having not more than 0.05 wt.% Pb.

The addition of P is taught in D2 (paragraph [0063]), but the amount is not disclosed.

Sn is indicated as being "about 1.5%". D2 does not teach lowering the amount of Sn.

It is also evident from Figure 2 of D2 that the amount of less than 0.09% given for Pb does not imply an amount of not more than 0.05%, since not all the compositions according to the examples comprise less than 0.05%.

D2 teaches that manganese may be present (paragraph [0066]), but the amount given in claim 12 is below the amount claimed in the patent.

Even if the skilled person trying to solve the posed problem consulted D3, there is no teaching in D3 of the combination of the ranges of P, Sn and Mn claimed (see also Table 1 in paragraph [0069]). The appellant's argument that the skilled person would choose the amount of Mn as present in D3 is based on hindsight, since there is no reason to only adapt one specific element without adapting the others in line with D3. In particular, all the examples in Table 1 having an Mn and Sn content within the ranges claimed in the patent in suit have a P content of 0.3% and an S content of less than 0.2%, which are outside the ranges claimed in the patent in suit.

- 3.1.6 The subject-matter of claim 1 involves an inventive step. This also applies to claims 2 to 4, which are directly or indirectly dependent on claim 1.

3.2 Claims 5 to 10

There were no objections from the appellant's side concerning method claims 5 to 10. The board sees no reason to object to these claims. Therefore, they are considered allowable.

4. Since the inventive step of claims 1 to 4 is acknowledged, the question of admission of the attack based on D2 pursuant to Article 12(4) and (6) RPBA 2020 does not need to be addressed.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the opposition division with the order to maintain the patent in amended form with claims 1 to 10 of auxiliary request A submitted on 20 February 2023 and a description to be adapted to these claims.

The Registrar:

The Chairman:



C. Vodz

E. Bendl

Decision electronically authenticated